

# Supplement to INFORMATION LETTER

Not for  
Publication

NATIONAL CANNERS ASSOCIATION

For Members  
Only

No. 1766

Washington, D. C.

February 13, 1960

## Consumer Confidence in Canned Foods: Industry's Responsibility

The National Canners Association was founded principally to improve and maintain consumer acceptance of canned foods. The first step in achieving that objective was to insure universal wholesomeness of canned foods. The Association, in order to achieve this objective, has maintained a number of programs dealing with many phases of the problem. One of the most important of these is the educational program designed to develop consciousness among all canners of their responsibility in connection with the canning and selling of only wholesome food. Recognizing as the N.C.A. does the rights and economic freedoms of the individual and his desire for personal gain, the approach has been to convince the individual canner that his long-range personal welfare can be achieved only by providing his consumers with only wholesome food.

The continued evolution among canners of this enlightened self-interest requires that the N.C.A. keep its program constantly and currently adjusted to all problems as they arise. The food additive amendment to the Food and Drug Act presents such a problem.

This problem was dealt with at the recent annual meeting and convention of the N.C.A., January 16 to 20, 1960. A re-evaluation of the Association's policy in the light of this new problem was considered by the Administrative Council at its meeting January 16. The Council reaffirmed the long-time policy of the Association which calls for aiding the member to assume his responsibility for preserving the wholesomeness of canned foods as measured both by scientific and legal criteria, and to cooperate with the Food and Drug Administration to make that program effective on those who would not, under the N.C.A. guidance, voluntarily conform.

The Board of Directors, at its meeting the following day, approved this policy and placed its stamp of approval on the Association's program to carry it out. The Association members, at a special meeting Tuesday afternoon, January 19, were given a complete review of the history of the N.C.A. policy as well as a program for implementing this policy. By the unanimous adoption of the following resolution, the membership voted to approve the recommended program.

### CANNING INDUSTRY RELATIONSHIP WITH FEDERAL FOOD AND DRUG ADMINISTRATION

"For more than half a century the National Canners Association and those responsible for the administration and enforcement of the Federal Food, Drug, and Cosmetic Act have worked together to assure consumers that they receive wholesome, informatively labeled, and high quality canned foods. The Federal Food and Drug Administration has long recognized that this goal could not possibly have been attained solely through legal enforcement procedures but required the voluntary cooperation of the canning industry through the Research Laboratories, the Raw Products Research Bureau, and the other divisions of the Association. The consumer, the Food and Drug Administration, and the canning industry have benefited from what Commissioner George P. Larrick has termed 'the habit of close cooperation' between the National Canners Association and that administration. That policy of close and confident cooperation has contributed to the formulation of reasonable food standards, to the development of improved canning techniques, to the protection and improvement of both the raw and processed product, to better plant sanitation, and to the enactment of legislation when needed for consumer protection. Both the National Canners Association and the Food and Drug Administration have fully appreciated their joint responsibility to the consumer, and in cooperatively meeting that responsibility have won for canned foods a deserved reputation for wholesomeness and quality. In the public interest this Association continues to subscribe to these established policies of mutual trust, confidence and full cooperation."

### The Protective Screen

A protective screen against chemical contamination maintained by the canner, with his grower's cooperation, insures a wholesome food product delivered to the canning plant, where by controlled processing in hermetically sealed containers (can or glass) that wholesomeness is delivered to the consumer intact.

## A Program To Prevent Contamination of the Raw Product

N.C.A. By-laws require of members that "only wholesome raw materials" be used.

### N.C.A. Policy on Grower Use of Pesticide Chemicals

The National Canners Association, in order to protect the integrity of canned foods and to assure the prevention of any hazardous residues, has adopted certain specific recommendations which will be made to all canners in the United States.

These recommendations are based primarily on the legal aspects of complying with regulations of the Food and Drug Administration and the U. S. Department of Agriculture. The canner need not necessarily approve the use of all pesticide chemicals which have been registered for use on each crop, but has the privilege of putting limitations on the use of certain chemicals if they in any way influence the flavor or quality of the crop being purchased.

Following is an outline of the N.C.A. policy concerning grower use of pesticide chemicals:

Canners processing crops that have been treated, or produced on land that has been treated, with any pesticide chemical—including insecticides, fungicides, rodenticides, herbicides, fumigants, defoliants, nematocides desiccants, and plant growth regulators—should be absolutely certain that such chemical has been accepted for registration by the U. S. Department of Agriculture under the Federal Insecticide, Fungicide, and Rodenticide Act.

Each canner should prepare and supply his growers with a list of pesticide chemicals from those accepted for registration under the Federal Act, which may be used on crops which he processes. It should be the responsibility of canners to see that their growers use these registered pesticide chemicals in accordance with the recommendations of the U. S. Department of Agriculture, State Agricultural Experiment Stations, and the Extension Service.

Each canner should make sufficient periodic contacts with his growers to assure himself that if these pesticide chemicals are used, they are used properly.

Canners should maintain detailed records showing how pesticide chemicals have been used in the production of crops for processing.

Each canner purchasing crops under contract should obtain written statements from his growers that they will use only registered pesticide chemicals, in accordance with recommended procedures. Canners purchasing canning crops on the open market should obtain written statements from the growers that they used only registered pesticide chemicals, in accordance with recommended procedures.

Canners should participate in the development of an educational program on the proper use of pesticide chemicals in cooperation with their State Agricultural Experiment Station, the Extension Service, producer organizations, and other interested groups.

### Written Assurances That Canning Crops Are Free of Illegal Chemicals

The written statements that canners should obtain from growers and other raw product suppliers—to ensure that only registered pesticide chemicals are used, and that no illegal or unsafe residues remain on the crops—may be adopted to the practices of each canner and to the particular circumstances under which he operates. The N.C.A. recommends, however, that the statement be drafted to accord with the following language:

#### CONTRACT CROPS

"The grower agrees to use in the production, transportation and storage of the crop only those pesticide chemicals that are registered under the Federal Insecticide, Fungicide, and Rodenticide Act, in strict accordance with the procedures recommended by the United States Department of Agriculture. The grower warrants that the crop, when delivered to the buyer, will contain no residues of any pesticide chemical which is unsafe within the meaning of section 408(a) of the Federal Food, Drug, and Cosmetic Act."

#### OPEN MARKET PURCHASES

"The grower warrants that he has used in the production, transportation and storage of the crop only those pesticide chemicals that are registered under the Federal Insecticide, Fungicide, and Rodenticide Act, in strict accordance with the procedures recommended by the United States Department of Agriculture. The grower further warrants that the crop contains no residues of any pesticide chemical which is unsafe within the meaning of section 408(a) of the Federal Food, Drug, and Cosmetic Act."

It should be understood clearly that no form of guarantee from the grower can operate to relieve the canner from his liability under the Federal Food, Drug, and Cosmetic Act. If the canner sells canned foods that are adulterated or misbranded—including foods that contain unsafe pesticide chemicals or other food additives—he remains subject to criminal prosecution, injunction, and seizure of his products, whether or not he has a guarantee from his grower. The written statements recommended above serve primarily as a means of informing the grower of his responsibility, and of assuring the canner that his raw product contains no hazardous residues of pesticide chemicals. In addition, the statement may be regarded by the Food and Drug Administration as evidence of the canner's good faith efforts to comply with the law.

### Information to Canners and Growers on How Pesticide Chemicals May Be Used Legally

The N.C.A. Raw Products Research Bureau has sent to all fruit and vegetable canners a special publication of the National Agricultural Chemicals Association listing official FDA tolerances on pesticides. This special issue by the N.A.C.A. has been checked thoroughly by the Food and Drug Administration and is up to

date as of February 1, 1960. Pesticides which have been registered for use on specific fruit and vegetable crops are listed with their tolerances. A cross index enables anyone to check tolerances either by crops or by chemicals.

The Raw Products Research Bureau has compiled a list of herbicides, nematocides, soil fumigants, and growth regulators which have been registered for use by the U.S. Department of Agriculture, most of them on a non-residue basis. This list (reproduced on pages 6-12) is up to date as of February 5, 1960. The N.C.A. is not recommending these herbicides, nematocides, soil fumigants, and growth regulators, but the list includes all of those which have been registered for use on fruits and vegetables used for canning. Any other herbicide, nematocide, soil fumigant, and growth regulator not on this list is illegal. Cannery should check very carefully with their Experiment Station and Extension Service personnel to determine which of these chemicals are recommended for use on canning crops. Cannery should be sure that the chemicals have been certified as useful for this purpose.

A specially designed pesticide newsletter will be issued by N.C.A. to report current information to all cannery on any changes made in tolerances or on new chemicals registered for use by the U. S. Department of Agriculture and the Food and Drug Administration. A number of chemicals which have been used fairly extensively in various parts of the country on canning crops are not now registered for use under the Federal Insecticide, Fungicide, and Rodenticide Act. Some of these may be registered for use or may be given an extension so that they can be used in 1960. When these permissions are granted, this information will be sent to all cannery in the special pesticide newsletter.

## A Program To Prevent the Processing of Contaminated Raw Products

Cannery should inspect all incoming raw products and provide for their rejection if they are contaminated by illegal chemicals.

### Raw Product Testing

Special attention is being given in the N.C.A. Laboratories to the development for industry use of simple analytical methods for detection of additives. Many such tests have already been evolved by N.C.A. and others and are available to the industry. To pursue the matter further, however, a review will be made of the methods employed by FDA, USDA, pesticide manufacturers, and recognized commercial laboratories for the various additives likely to be encountered in canned foods; and where no simple, accurate analytical procedures exist, appropriate research will be undertaken for their development.

Where it is not now being done, some system of quality control and routine product checking should be

### N.C.A. Activity To Promote Understanding on the Legal Use of Pesticide Chemicals

The N.C.A. will seek to promote understanding of the conditions under which pesticide chemicals may be used legally, through personal contacts with cannery and in their appearances at cannery meetings.

The staff of the Raw Products Research Bureau is arranging to speak on the subject at cannery schools and at other meetings sponsored by the state, regional, and commodity cannery associations. The support of executive secretaries of such groups is solicited in all such endeavors.

Cooperation also will be sought of the USDA Extension Service to have county agents assist growers of canning crops, of the Land-Grant Colleges and Experiment Stations, the farm organizations, farm editors and rural newspapers, and canning trade journals, to disseminate complete and accurate information on the subject.

### Insuring That the Canner and Grower Follow Authoritative Recommendations

The canner, through his field staff, should maintain close contact with his canning crops producers throughout the growing season, to ensure that only certified chemicals are used and are applied properly.

Chemical manufacturers and distributors are important in such an educational program, and their cooperation will be sought by the N.C.A. in treating the subject in a responsible manner. The N.C.A. will seek also to inform those, including aviators, who apply agricultural chemicals.

set up within the cannery so that any abnormalities can be detected before serious difficulties arise. If a canner is making his own analyses he should have duplicate samples run periodically by another laboratory as a safeguard against undetected errors. N.C.A. will be happy to perform this service for its members.

Cannery who do not have facilities for testing their own products will probably want to have this done by a reliable commercial laboratory. The N.C.A. will, upon request, assist them in making contact with such organizations and advise on the sampling and testing procedures if desired. The N.C.A. Laboratories will run duplicate samples to help cannery check the accuracy of these analysts.

### Removal of Objectionable Residues

The N.C.A. Laboratories have worked and will continue to work on the development of more efficient washing, peeling, and preparation procedures to remove objectionable residues from raw product before canning.



## A Program of Protection against the Addition of Illegal Chemicals during Processing

An additive, by definition, is any ingredient or substance added to food, intentionally or otherwise, which is not generally recognized as safe and which has not had prior approval.

While the first emphasis of this problem has been on pesticides, many other substances are of concern, such as detergents for product washing or cleaning, germicides, antibiotics, gases used for germicidal treatments of certain food ingredients, any substances transmitted from a container to its contents, flavorings, colorings, oils, processing ingredients for products which receive pre-canning treatment with these chemicals, etc. Some such materials may be generally recognized as safe or have had prior sanction, others not. The problem is to determine their status under the Food Additives Amendment based on present or intended use.

If the Color Additives Amendment is enacted as proposed by FDA, problems will arise from the fact that it may contain a broad definition of color, the Delaney cancer clause, no grandfather clause, and a licensing provision with limited procedural safeguards. If the legislation were to cover all colors, and all processes or additives that might affect color in any way, as has been suggested, this could certainly have many ramifications of importance to the canning industry.

### The N.C.A. Program of Protection against the Addition of Illegal Chemicals during Processing

The N.C.A. Laboratories, with Counsel, will continue to work for individual member canners or groups of canners with FDA on specific additives problems, and will assist industry in getting FDA clearance for chemicals which are considered unavoidable or necessary in the production of good quality canned foods. Additions to the list of additives generally recognized as safe will be called to the attention of the industry as new materials are considered by FDA. As one means of keeping industry informed, opportunities will be sought to explain the food additives question to canners' groups throughout the country.

The Laboratories will keep in touch with other agencies, such as National Research Council committees, university food technology departments, etc., on the additives problem so that all interested groups can work toward a common goal. N.C.A. members will be assisted in locating sources of information on previous usage or testing of additives.

As with pesticide residue, methods of analyses for these other additives will be adapted or developed for use in industry laboratories.

In addition to examining occasional duplicate samples for canners as a check on the accuracy of their company analysts, the N.C.A. Laboratories will help in any emergency. With a limited staff it is, of course,

possible to give adequate service of this kind to the entire industry only by avoiding routine control work.

A program is being undertaken with ingredient suppliers to insure against product contamination from this source.

The N.C.A. Laboratories will continue to disseminate advice on good housekeeping and sanitation to prevent objectionable materials entering food. This program, as in the past, will involve both industry conferences and individual plant surveys.

Toxicity testing is beyond the scope of the N.C.A. Laboratories and is primarily the responsibility of suppliers. Where this information is not available, however, and canners desire to use new additives of unknown toxicity, they will be assisted in making contact with reliable toxicological testing laboratories.

Constant watch will be maintained by N.C.A. on this whole area of additives from a technical and regulatory standpoint and if conditions arise which need to be brought to the attention of individual canners or groups of canners, this will be done by whatever means are appropriate to the particular situation.

### The Canner's Responsibility

Canners must themselves be sure about additives because the responsibility cannot be shifted to ingredient suppliers or others by use of guarantees, though such guarantees serve a useful purpose in emphasizing the duties of all concerned.

The Food and Drug Administration has published three lists of additives which are "generally recognized as safe" (GRAS) and is working on others. These were published as Supplements to the following issues of the INFORMATION LETTER: Nov. 28, 1959, Jan. 30, 1960, and Feb. 6, 1960. Canners should check their food ingredients against these lists to see if there are any problems. It should be remembered, however, that these lists are not all-inclusive and the absence of any material from them does not necessarily mean that the substance is not "generally recognized as safe." When a canner wishes to use an unlisted additive or wants to use one for a purpose other than that approved, or has any questions regarding additives, it is recommended that he check with N.C.A. for guidance.

Canners should keep records on the product, the ingredients, and any factors which may affect the product, and should relate these to can codes. The latter should be changed at frequent intervals so that, if necessary, any lot can be segregated as to source of raw material, ingredients used, or other operating variable.

Canners should use only ingredients of food grade and purity, obtained from reliable suppliers, because substances in addition to the desired ingredient could be added from this source.

## Application of Food Law Guarantee to Food Additives and Pesticide Chemicals

A number of canners have inquired whether the N.C.A. Recommended Food Law Guarantee should be revised to add a specific reference to food additives and pesticide chemicals. Many of these canners have been requested by their buyers to add a clause guaranteeing that their products contain no food additives or pesticide chemicals which are unsafe within the meaning of the Federal Food, Drug, and Cosmetic Act.

As reported in an article in the INFORMATION LETTER of February 7, 1959, Association Counsel has advised canners that the Recommended Guarantee is entirely adequate as written, and need not be revised. That guarantee assures buyers that no article of food sold to them will be adulterated or misbranded within the meaning of the Federal Act. If an article of food contains an unsafe food additive or pesticide chemical, the product is adulterated under the Act. Therefore, a specific reference to the Miller Pesticide Amendment and the Food Additives Amendment of 1958 is unnecessary.

Counsel has advised, however, that canners may wish to add the words "as amended" following the reference to the Federal Food, Drug, and Cosmetic Act of June 25, 1938, in order to assure their buyers that they are fully protected. With this change, the recommended Guarantee reads:

### "PURE FOOD GUARANTEE"

"Seller, ABC Canning Company, guarantees that no articles of food sold by seller to buyer, The XYZ Company, during the period in which this guarantee is effective will be adulterated or misbranded within the meaning of the Federal Food, Drug, and Cosmetic Act of June 25, 1938, as amended, or within the meaning of any State Food and Drug Law the adulteration and misbranding provisions of which are identical with or substantially the same as those found in the Federal Act, and that such goods will not be produced or shipped in violation of Section 404 or 301(d) of said Federal Act; provided, however, that the seller does not guarantee against such goods becoming adulterated or misbranded within the meaning of said Act or Acts after shipment, by reason of causes beyond seller's con-

trol; and provided also that where goods are shipped under buyer's labels, seller's responsibility for misbranding shall be limited to that resulting from the failure of the product to conform to the label furnished by the buyer. Buyer undertakes to save seller harmless from any liability under said Act or Acts for any other type of misbranding arising out of the use of buyer's labels, or for any liability under said Act or Acts for misbranding where buyer insists upon the use of any label after seller has questioned in writing the use of such label.

"This guarantee shall become effective when it has been signed by both parties, and shall continue to be effective until it is revoked by either party by the giving of ten days' written notice to the other party.

"ABC Canning Company, Seller,

Any place, Wisconsin

By .....

"Accepted:

The XYZ Company, Buyer,

..... Street,

City, State.

By ....."

Some buyers have insisted that a clause be added to the Guarantee, such as:

"The seller further guarantees that the articles of food comprising each pack, shipment, delivery or consignment made to buyer will not bear or contain any food additive, pesticide, or other substance as of the date of such pack, shipment, delivery or consignment, which is unsafe within the meaning of the Federal Food, Drug, and Cosmetic Act, with all revisions and amendments pertaining thereto."

As explained above, this clause is not necessary, in that it does not extend the seller's liability or the buyer's protection, but canners may safely include such a clause if their buyers so insist. The inclusion of this clause will involve no additional undertakings for canners beyond those provided in the present form of the Recommended Guarantee.

### Herbicides, Nematocides, Soil Fumigants and Growth Regulators

The chemicals listed on the following pages are registered for use on canning crops under the Pesticide Act.

(These are not necessarily recommended by the National Canners Association but any herbicide, nematocide, soil

fumigant or growth regulator not appearing on this list is not registered for use on canning crops as of February 5, 1960.)

	Use	Tolerance or no	Max. Dosage lbs./Acre	Limitations
AMINOTRIAZOLE	Corn	N.R.	4	10-14 days preplant
	Cranberries	N.R.	8	7-10 days after harvest
	Apples; pears	N.R.	2	Before fruit forms and after harvest
ALLYL ALCOHOL	Vegetable seed bed	N.R.	150	Apply 10-12 days before seeding. Aerate 7 days after treatment
BIS (ETHYLXANTHIC) DISULFIDE	Onions	N.R.	10	Pre-emergence only 24-48 hrs. before crop emerges
CDAA (2-chloro, <i>N,N</i> -diallyl acetamide) <i>Handex</i>	Beans (snap and lima)	N.R.	4	Pre-emergence only
	Cabbage	N.R.	4	On seeded crop
		N.R.	6	Transplants at planting
	Corn (all)	N.R.	4	Pre-emergence only
	Onions	N.R.	6	2 applications—at planting and at 3 true leaves
	Peas	N.R.	4	Pre-emergence only
CDEC (2-chloroallyl diethyl-dithiocarbamate) <i>Vogdex</i>	Beans (snap and lima)	N.R.	4-6	Pre-emergence or at planting
	Beets	N.R.	4-6	Pre-emergence or at planting
	Celery	N.R.	4-8	Pre-emergence or at planting
	Cole crops	N.R.	4-8	Pre-emergence or at planting
	Collards	N.R.	4	Pre-emergence or at planting
	Corn (field or sweet)	N.R.	4-6	Pre-emergence or at planting
	Kale	N.R.	4	Pre-emergence or at planting
	Mustard greens	N.R.	4	Pre-emergence or at planting
	Spinach	N.R.	4	Pre-emergence or at planting
	Turnips	N.R.	4	Pre-emergence or at planting
CHLOROPICRIN	Seed beds and strawberries	N.R.	482	2 weeks pre-planting, disc or aerate before planting
	Celery seed beds	N.R.	958	2 weeks pre-planting, disc or aerate before planting
	Mushrooms			
CIPC (Isopropyl <i>N</i> -(3-chlorophenyl) carbamate)	Beans (snap and lima)	N.R.	4.4	Pre-emergence only
	Caneberries	N.R.	6.6	Dormant spray
	Carrots	N.R.	6.5	Pre-emergence
	Carrots	N.R.	4.0	Post-emergence
	Celery	N.R.	7.0	Post-emergence when crop is set
	Collards	N.R.	2.0	Pre-emergence
	Kale	N.R.	2.0	Pre-emergence
	Onions (seeded)	N.R.	8.0	Pre-emergence
	Onions (sets)	N.R.	6.0	Same day onions are set
	Peas	N.R.	4.0	Pre-planting
	Peas	N.R.	6.0	Pre-emergence
	Spinach	N.R.	2.0	Pre-emergence after seeding

## CIPC (continued)

Use	Tolerance or no	Max. Dosage lbs./Acre	Limitations
Strawberries	N.R.	3.0	Fall application
Sweet potatoes	N.R.	2.0 (granular only)	At lay-by
Tomatoes	N.R.	4.0 (granular only)	At lay-by
Turnip Greens	N.R.	2.0	Pre-emergence after seeding

2,4-D  
(2,4-dichlorophenoxy acetic acid)

Asparagus (sodium salt)	5 ppm	2.5	No more than 2 applications 1 month apart
Grapefruit, Lemons, Oranges, Tangerines, Apples, Pears, Quinces	5 ppm		
Corn (field)	N.R.	2.0	Pre-emergence
Corn (sweet)	N.R.	1.5	Pre-emergence
Corn (sweet)	N.R.	0.5	Post-emergence
Potatoes	N.R.	2.0	Pre-emergence
Raspberries	N.R.	0.5	Apply 1st year and on non-fruiting stands
Strawberries	N.R.	1.5	Dormant season, before blossoming

DALAPON  
(Sodium salt of 2,2-dichloropropionic acid)

Apples	3 ppm	12.75	8-10 ft. circle around tree
Apricots	1 ppm	12.75	Spray within 3 ft. radius of trunks— not more than twice in one season
Asparagus	30 ppm	25.5	In 2 applications (before and after cutting)
Cranberries	5 ppm	10.2	Apply in fall after harvest. Do not harvest berries grown the same year following treatment
Peaches	15 ppm	12.75	Spray within 3 ft. radius of trunks— not more than twice in one season
Pears	3 ppm	12.75	8-10 ft. circle around tree
Pineapples	3 ppm	10	1-6 months pre-harvest
Plums	1 ppm	12.75	Spray within 3 ft. radius of trunks— not more than twice in one season
Potatoes	10 ppm	2.5-8.5	To quack grass before plants emerge

DICHLONE  
(2,3-dichloro-1,4-naphthoquinone)

Apples	3 ppm	4	1 day of harvest
Cabbage	N.R.	0.4	4 weeks after transplant
Celery	3 ppm	0.75	None
Cherries	3 ppm	1.25	3 days
Peaches	3 ppm	2.5	7 days
Pears	N.R.	2.5	First cover
Plums	3 ppm	1.25	3 days
Prunes	3 ppm	1.25	3 days
Nectarines	N.R.	0.3	Not after blossoming
Sweet potatoes	N.R.	2 lbs. of 50% in 100 gals. of water	Dip before storage
Tomatoes	3 ppm	1.25	None
Apricots	N.R.	2.0	Not after petal fall
Beans	3 ppm	1.12	7 days
Potatoes (foliage)	N.R.	1.3	None
Raspberries	N.R.	1.0	Not after bloom
Strawberries	15 ppm	0.375	3 days

	Use	Tolerance or no	Max. Dosage lbs./Acre	Limitations
4-(2,4-DICHLOROPHENOXY) BUTYRIC ACID (DIMETHYLAMINE SALT)  O-2,4-DICHLOROPHENYL O,O- DIETHYLPHOSPHOROTHIOATE	Peas (for seed only)	N.R.	1.5	Apply 4-6 node stage; do not graze livestock on treated fields
	Corn	N.R.	150 gal. (of 75% solution)	Pre-planting only
	Cucumbers	N.R.	150 gals. (of 75% solution)	Pre-planting only
	Peppers	N.R.	150 gals. (of 75% solution)	Pre-planting only
	Squash	N.R.	150 gals. (of 75% solution)	Pre-planting only
	Strawberries	N.R.	150 gals. (of 75% solution)	Pre-planting only
	Tomatoes	N.R.	150 gals. (of 75% solution)	Pre-planting only
DISODIUM 3,6-ENDOXOHEXAHYDROPHthalate <i>Endothal</i>	Beets, table	N.R.	6.0	Pre-emergence only
	Spinach	N.R.	5.0	Pre-emergence only
DIURON (3-(3,4-dichlorophenyl)-1,1-dimethylurea)	Blueberries	N.R.	1.6-2.4	Late fall or early spring
	Caneberries	N.R.	2.4	Fruit not present—Wash.-Ore. only
	Gooseberries	N.R.	1.6-2.4	Late fall or early spring
	Grapes	1 ppm	4	Band treatment, spring, fall, or winter
	Olives	N.R.	1.6	Two applications per year, fall and spring
	Potatoes	1 ppm	0.8	Pre-emergence
	Tomatoes	N.R.	0.8	On soil only—not after fruit forms
DNAP (2,4-dinitro-6-sec-amylphenol)	Asparagus	N.R.	1.5	Dormant—early winter
	Orchards and vineyards	N.R.	2.3	Apply early spring
	Strawberries	N.R.	1.5	Dormant—to middles and shoulders of beds
DNAP—DNBP (Mixture) (+butyl-phenol)	Asparagus	N.R.	1.5	Dormant application only
	Caneberries	N.R.	2.25	Dormant application only
	Orchards and vineyards	N.R.	2.25	Pre-emergence only
	Peas	N.R.	1.5	Pre-planting only
	Potatoes	N.R.	1.5	Pre-planting only
DNBP (2,4-dinitro-6-sec-butylphenol)	Strawberries	N.R.	2.25	Dormant only
	Beans	N.R.	0.93	Pre-emergence application only
	Cane fruits	N.R.	2.8	Post-harvest in fall or early spring
	Corn	N.R.	0.93	Pre-emergence application only
	Cucurbits	N.R.	0.93	Pre-emergence application only
	Grapes	N.R.	2.8	Post-harvest in fall or early spring
DNBP (Alkanol Amine Salts)	Potatoes	N.R.	0.93	Pre-emergence application only
	Beans (all)	N.R.	9	Pre-emergence only
	Beans (all)	N.R.	4.5	Post-emergence to crook neck stage
	Corn (all)	N.R.	9	Pre-emergence only



	Use	Tolerance or no	Max. Dosage lbs./Acre	Limitations
DNBP (continued) (Alkanol Amine Salts)	Grapes	N.R.	1.25	Dormant only
	Peas	N.R.	9	Pre-emergence application
	Peas	N.R.	4.5	Post-emergence application
	Potatoes	N.R.	6	Pre-emergence only
	Strawberries	N.R.	4.5	Dormant application only
DNPB (Ammonium Salt)	Peas	N.R.	0.75	When peas 4-8" tall. Do not feed pea hay to stock
DNOC (4,6-dinitro-o-cresol)	Apples	N.R.	4.5	Dormant application only
	Apricots	N.R.	3.8	Dormant or delayed dormant applica- tion only
	Asparagus	N.R.	1.0	Application only before growth starts
	Caneberries	N.R.	1.25	Application only at green tip stage
	Cherries	N.R.	4.5	Dormant application only
	Peaches	N.R.	1.25	Dormant application only
	Pears	N.R.	3.8	Dormant application only
	Plums	N.R.	3.8	Dormant or delayed dormant applica- tion only
	Prunes	N.R.	3.8	Dormant or delayed dormant applica- tion only
	Mushroom houses	N.R.	1 gal. of the 19% sodium salt/100 gals. water	Spray interior of mushroom houses between crops, when mushrooms are not present
DYRENE (2,4-Dichloro-6-(O-chloroanilino) Triasine)	Celery	10 ppm	3	No time limitations. Trim and wash
	Potatoes	1 ppm	2.6	No time limitations
	Tomatoes	10 ppm	2.6	No time limitations
	Asparagus	10 ppm	108	Pre-planting soil treatment—3 weeks aeration
ETHYLENE DIBROMIDE	Beans	5 ppm	108	Pre-planting soil treatment—3 weeks aeration
	Carrots (with or without tops)	75 ppm	108	Pre-planting soil treatment—3 weeks aeration
	Strawberries	5 ppm	108	Pre-planting soil treatment—3 weeks aeration
	Sweet potatoes	50 ppm	108	Pre-planting soil treatment—3 weeks aeration
ETHYL DI-n-PROPYLTHIOLCARBAMATE <i>Eptam</i>	Beans (snap)	N.R.	3	Pre-planting soil application only
	Potatoes	N.R.	2-6	Pre-planting application to soil
HEXACHLOROPHENE (2,2'-Methylene-bis (3,4,6-Trichlorophenol))	Beans (snap)	N.R.	0.3	Pre-emergence and row soil drench
	Cabbage	N.R.	0.3	Pre-emergence and row soil drench
	Cucumbers	N.R.	0.3	3-5 day intervals to bloom—soil drench
	Peppers	N.R.	1.0	Pre-emergence and 5-day intervals up to bloom—soil drench
	Tomatoes	N.R.	1.0	Pre-emergence and 5-day intervals up to bloom—soil drench
IPC (Isopropyl N-phenylcarbamate)	Peas	N.R.	3.9	Pre-planting work into top 4"-6" soil
	Spinach	N.R.	5	Pre-emergence
	Spinach	N.R.	4	Post-emergence, not after 2-4 leaf stage
	Strawberries	N.R.	6	Dormant treatment only

	Use	Tolerance or no	Max. Dosage lbs./Acre	Limitations
<b>MCPA</b> (2-methyl-4-chlorophenoxyacetic acid)	Peas	N.R.	.5	When 3-7 inches tall
<b>METHYL BROMIDE</b>	Soil treatment, preplant	N.R.	2 lbs./100 sq. ft.	Aerate 72+ hrs.
<b>MONURON</b> (3-(p-chlorophenyl)-1,1-dimethylurea)	Asparagus	7 ppm	3.2 6.0	Pre-emergence Before spears appear and after harvest
	Grapefruit	1 ppm	1.6	Apply late September—early October. Avoid spraying fruit
	Lemons	1 ppm	1.6	Apply late September—early October. Avoid spraying fruit
	Onions (dry bulb only)	1 ppm	1.6	Pre-emergence, 2 days before onions emerge. Final, 21-28 days before harvest, apply to ground
	Oranges	1 ppm	1.6	Apply late September—early October. Avoid spraying fruit
	Pineapples	1 ppm	4.8	Just after planting (18 months)
	Spinach	1 ppm	0.8	At planting
<b>MYLONE</b> (3,5-Dimethyltetrahydro-1,3,5,2H-Thiadiazino-2-Thione)	Cabbage	N.R.	275	Soil fumigant (3 week aeration)
	Peppers	N.R.	275	Soil fumigant (3 week aeration)
	Tomatoes	N.R.	275	Soil fumigant (3 week aeration)
<b>NPA</b> (N-1 naphthyl phthalamic acid) <i>Alasop</i>	Asparagus (seed beds)	N.R.	7.2	Pre-emergence. Apply 24-48 hours after seeding as area treatment
	(established beds)	N.R.	7.2	Apply 48 hours after first spring discing
	Cucumbers	N.R.	5.4	Pre-emergence
	Cucumbers	N.R.	3.6	Post-emergence. Apply immediately after transplanting or just before vining
	Pumpkins	N.R.	3.6	Pre-emergence. Some varieties are injured by NPA
	Squash	N.R.	3.6	Pre-emergence. Some varieties are injured by NPA
<b>SODIUM SALT OF NPA</b> (Sodium salt of N-1 naphthyl phthalamic acid) <i>Alasop</i>	Asparagus	N.R.	8 <sup>1</sup>	Pre-emergence. Apply as area treat- ment within 48 hours of seeding
	Asparagus (established beds)	N.R.	8	Apply 48 hours after first spring discing. Repeat at close of cutting season, right after last cultivation
	Cucumbers	N.R.	6	Pre-emergence
	Cucumbers	N.R.	4	Post-emergence. Apply just before vining, immediately after trans- planting
	Pumpkins	N.R.	4	Pre-emergence <sup>2</sup>
	Squash	N.R.	4	Pre-emergence
	Watermelons	N.R.	6	Pre-emergence
	Watermelons	N.R.	4	Post-emergence. Apply immediately after transplanting or just before vining <sup>2</sup>

<sup>1</sup> With band application, use proportionately lower dosages.

<sup>2</sup> Do not apply in California, Arizona, New Mexico, and Texas except in granular form.

	Use	Tolerance or no	Max. Dosage lbs./Acre	Limitations
n-1 NAPHTHYL PHTHALIMIDE	Sweet potatoes	N.R.	3.6	Slip treatment. Apply immediately after planting
	Sweet potatoes	N.R.	3.6	Lay-by application. Apply immediately after last cultivation over the tops spray
NPA (Amide form)	Sweet potatoes	N.R.	3.6	Slip treatment (post transplant) and immediately after last cultivation (40-75 days before harvest)
PCNB (Pentachloronitrobenzene)	Beans	N.R.	7.5	Soil and seed treatment only (at planting time)
	Beans (foliage)	N.R.	5 (in dust) 2 (in spray)	Not after 1st bloom. Do not feed to stock
	Cole crops	N.R.	4.5 lbs./100 gals. water	Transplant solution— $\frac{1}{4}$ pt. per plant
	Cole crops	N.R.	40	Row application—prior to transplanting
	Cole crops	N.R.	60	Broadcast—prior to planting
	Peppers	N.R.	7.5	Transplanting time
	Tomatoes	N.R.	7.5	Transplanting time
	Potatoes	N.R.	195 (wetttable powders or dusts only)	Broadcast—prior to planting
	Potatoes	N.R.	65 (wetttable powders or dusts only)	Row treatment—prior to planting
PENTACHLOROPHENOL	Potatoes	N.R.	8.2	Pre-emergence
	Potatoes	N.R.	8.2	Post-emergence (first shoots visible)
SESONE (Sodium 2,4-dichlorophenoxyethyl sulfate)	Asparagus	2 ppm	3.6	Pre-emergence and after cutting season
	Corn (seed), field and sweet	N.R.	3.6	At lay-by. Do not use treated grain or forage for food or feed
	Potatoes	6 ppm	3.0	Pre-emergence and then monthly to lay-by
	Strawberries	2 ppm	3.6	7 days of picking
SIMAZINE (2-chloro-4,6-Bis (Ethylamino)-s-Triazine)	Corn	N.R.	4.0	Broadcast pre-emergence
	Corn	N.R.	1.0	Band (12 inch) pre-emergence
	Strawberries	N.R.	1.0	1st—4 weeks after planting 2nd—in fall of bearing year. (Use only on Marshall and Northwest varieties in Northwest)
SODIUM ARSENITE	Grapes	N.R.	3.13	Dormant vines
	Potatoes	N.R.	10	7 days, not on exposed tubers
STREPTOMYCIN	Apples	N.R.	50 ppm	Do not apply after fruit is visible
	Beans	N.R.	400 ppm	Apply before pods appear
	Celery	N.R.	200 ppm	Application when first true leaves appear. Plant beds only
	Cucumbers	N.R.	400 ppm	Do not apply after edible parts begin to form
	Pears	N.R.	50 ppm	Do not apply after fruit is visible

	Use	Tolerance or no	Max. Dosage lbs./Acre	Limitations
STREPTOMYCIN (continued)	Peppers	N.R.	200 ppm	Do not apply after edible parts start to form
	Potatoes	N.R.	100 ppm	Soak cut seed pieces 30 minutes in 100 ppm
	Tomatoes	N.R.	200 ppm	Do not apply after edible parts begin to form
2,4,5-T (2,4,5-trichlorophenoxyacetic acid)	Rice	N.R.	1.5	Before flooding (before boot stage); after flooding
TCA (Trichloroacetic acid)	Cabbage	N.R.	8.1	Pre-emergence. Apply soon after planting
	Cauliflower	N.R.	8.1	Pre-emergence. Apply soon after planting
	Red beets	N.R.	8.1	Pre-emergence. Do not use treated tops for food or feed
	Tomatoes	N.R.	8.1	Pre-emergence
VAPAM (Sodium methyldithiocarbamate)	Soil fumigant for any crop	N.R.	400	7 days pre-plant application on light soil; 14 days pre-plant application on heavy soil